**Photocathode Physics for Photoinjectors 2018** 



Contribution ID: 4

Type: not specified

## Review of requirements and challenges for UED/UEM

Monday 15 October 2018 09:45 (20 minutes)

Ultrafast electron scattering (UES), including diffraction, imaging, and energy-loss spectroscopy, are emerging new techniques for visualizing dynamics of matter at atomic levels. These rapidly advancing new developments have generated scientific outcomes with broad and profound impacts in quantum material, solar energy conversion, chemical reaction, high energy density physics, and biology, among many other research fields. The capabilities of UES instruments are ultimately determined by the brightness of electron beams as well as how precisely we can shape the beams in spatial, angular, temporal, and energy domains. The photoemission process, which dictates how electron beams are generated in six-dimensional phase space at the very beginning, plays a critical role in defining the subsequent evolution and necessary manipulation of beams and hence the overall machine performances. In this talk, I will try to discuss the requirements of the photocathodes by making the connection to the required electron beam parameters for UES applications. Challenges and new R&D opportunities of photocathodes toward future UES instruments will also be discussed.

**Presenter:** Dr LI, Renkai (SLAC National Accelerator Laboratory) **Session Classification:** Session 2

Track Classification: Session 2: Application Oriented Research: Low Average Current